

^ Appl. No. 09/842,128

REMARKS/ARGUMENTS

On page 2 of the Detailed Action, the Examiner has rejected claims 1 to 23, 25 to 29, 32 to 39, 41 to 42, and 46 under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,415,163 (Keskitalo *et al.*) in view of United States Patent No. 6,131,016 (Greenstein *et al.*). Given below is a brief description of exemplary embodiments of the present invention and of the Keskitalo *et al.* and Greenstein *et al.* references, together with a detailed discussion on how claims 1 to 23, 25 to 29, 32 to 39, 41 to 42, and 46 are patentable over the Keskitalo *et al.* and Greenstein *et al.* references.

Exemplary Embodiments of the Invention

In an exemplary embodiment of the invention there is provided an Orthogonal Frequency Division Multiplexed (OFDM) Base Transceiver Station (BTS) arranged to communicate with a plurality of mobile terminals within a coverage area including at least one target mobile terminal. The BTS has a processing apparatus that operates to receive and process service and data traffic information. The BTS also has a transmission apparatus that operates to receive the processed service and data traffic information, to transmit the processed service information on the first set of carriers to the mobile terminals within the coverage area with at least one first transmission beam and to transmit the processed data traffic information on a second set of carriers to the target mobile terminal on at least one second transmission beam. The second transmission beam is a directional transmission beam. With reference to Figure 5 of the present application, in one embodiment the BTS is shown as BTS 50. In this embodiment there is only one first transmission beam corresponding to sector omni-directional beam 89 and there is only one second transmission beam corresponding to directional beam 88. With reference to Figure 7 of the present application, in another exemplary embodiment of the invention the first transmission beam corresponds to a service directional beam 119 and the second transmission beam corresponds to a data traffic directional beam 118. In this particular embodiment the directional service beam 119, in addition to the data traffic directional beam 118, is swept about a coverage area to reach all of mobile terminals 54, 56.

Keskitalo *et al.*

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The Keskitalo *et al.* reference discloses a method of transmitting pilot channels in a cellular radio network, in which, in each cell at least one base station communicates with the mobile stations located within its area. The base station transmits a data signal in a downlink direction by using transmission directions that change in time and transmits information about the system to the mobile stations on control channels. In particular, the Keskitalo *et al.* reference discloses a method for transmitting pilot channels in connection with adaptive antenna beams in an effort to increase the effectiveness of pilot channel transmission. The purpose of the arrangement according to the disclosure in the Keskitalo *et al.* reference is to use the pilot channels both as a phase reference and to facilitate handover. The Keskitalo *et al.* reference discloses a system in the context of a Code Division Multiple Access (CDMA) which is a multiple access method based on a spread spectrum technique. The use of adaptive antenna beams is undertaken in an effort to increase spectral efficiency in comparison with conventional cellular systems applying conventional CDMA. With respect, the CDMA method is quite dissimilar from the OFDM base transceiver station of the present invention.

Greenstein *et al.*

The Greenstein *et al.* reference discloses a system that provides transmit diversity with feedback to enhance reception of communication signals at a wireless communication terminal. In particular, multiple antennae are provided at a base station. The multiple antennae transmit multi-carrier information signals such as OFDM including pilot tones. The wireless communication terminal receives the pilot tones and performs processing on those tones to detect the relationship between the information signals transmitted from the various antennae of the base station. A feedback signal, based on the comparison of the pilot tones communicates back to the base station information about the channels of the respective transmit antenna to the terminals. The base station modifies the transmission processing associated with the various transmit antennae based upon the feedback signal. The modified processing is used to improve the reception of the information signals at the wireless communication terminal. With respect, this purported solution has little in common with the present invention.

Claim 1

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To begin, there are three requirements for establishing a *prima facie* case of obviousness:

1) all features must be present; 2) there must be an expectation of a reasonable chance of success; and 3) there must be some suggestion or motivation in the prior art to combine the references.

Claim 1 is directed to an OFDM Base Transceiver Station (BTS) arranged to communicate with a plurality of mobile terminals within a coverage area including at least one target mobile terminal, and recites in pertinent part:

“a processing apparatus that operates to receive and process service and data traffic information; and

a transmission apparatus that operates to receive the processed service and data traffic information, to transmit the processed service information on a first set of carriers to the mobile terminals within the coverage area with at least one first transmission beam and to transmit the processed data traffic information on a second set of carriers to the target mobile terminal on at least one second transmission beam, the second transmission beam being a directional transmission beam”.

According to this claim feature, the “processed service information is transmitted on a first set of carriers” and “the processed data traffic information is transmitted on a second set of carriers...on at least one second transmission beam, the second transmission beam being a directional transmission beam”. In OFDM, a Radio Frequency (RF) channel that is transmitted is subdivided into a plurality of data traffic carriers but it is not the case for CDMA where information of a signal is transmitted on a single carrier. As such, the Keskitalo *et al.* reference does not disclose a “transmission apparatus that operates...to transmit the processed service are on a first set of carriers...and to transmit the processed data traffic information on a second set of carriers”. Instead, what is disclosed in the paragraph referred to by the Examiner are pilot signals that are transmitted on a single carrier.

Regarding the Greenstein *et al.* reference, with reference to Figure 1 of that reference, a base station 10 has two antennae 15, 16 that transmit multi-carrier tone signals; however, there is no disclosure of the antennae 15, 16 being directional antennae. As such, again, there is no

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disclosure of the "processed service information is transmitted on a first set of carriers" and "the processed data traffic information is transmitted on a second set of carriers...on at least one second transmission beam, the second transmission beam being a directional transmission beam". Furthermore, as will be discussed below, there is no disclosure of how the cited references can be combined to produce this claim feature.

As such, requirement 1) for a *prima facie* case of obviousness is not satisfied.

Regarding requirement 2), since the features of claim 1 are not all disclosed by the cited references there is no reason to believe that there are any possible combinations of the teachings of the cited references which produce the desired result of the invention as claimed in claim 1, and this requirement is also not satisfied. In particular, there is no teaching in the cited references as to how the method of the Keskitalo *et al.* reference can be applied to an OFDM system. Furthermore, the Examiner has not shown how the teachings of the cited references can be combined to produce the desired result of the invention as defined in claim 1.

Regarding requirement 3), the method of the Keskitalo *et al.* reference is described in the context of CDMA. As admitted by the Examiner "Keskitalo fails to disclose An Orthogonal Frequency Division Multiplexed (OFDM) Base Transceiver Station (BTS). However, Greenstein teaches in an analogous art, [that] An Orthogonal Frequency Division Multiplexed (OFDM) Base Transceiver Station (BTS) (col. 2; 27-40 & col. 3; 59-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include An Orthogonal Frequency Division Multiplexed (OFDM) Base Transceiver Station (BTS) in order to provide transmit diversity with feedback to enhance the reception of communication signals at wireless communication terminal".

With respect, as discussed in column 2, lines 34 to 43 of the Keskitalo *et al.* reference CDMA systems have particular attributes. In particular, in a CDMA receiver, "the signals of the different receiver elements are combined advantageously, either coherently or incoherently, whereby a signal of good quality is achieved" (see column 2, lines 36 to 38 of the Keskitalo *et al.* reference). Furthermore, "CDMA systems can also apply a soft handle wherein a mobile station may simultaneously communicate with several base stations by utilizing macrodiversity. The

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connection quality of the mobile station, thus, remains high during the handover and the user does not notice a break in the connection" (see column 2, lines 39 to 44 of the Keskitalo *et al.* reference). The Examiner is suggesting a modification to the CDMA systems of the Keskitalo *et al.* reference which involves moving from a CDMA system to an OFDM system; however, such a modification would mean relinquishing the above described perceived "advantages" of the CDMA systems and clearly teaches away from the disclosure of the Keskitalo *et al.* reference. As such, requirement 3) cannot be satisfied. Furthermore, the Keskitalo *et al.* and Greenstein *et al.* references are directed to completely different modes of communication and solve completely different problems. In particular, the Keskitalo *et al.* reference makes use of CDMA and makes use of pilot channels to facilitate handover (see column 5, lines 17 to 22 of the Keskitalo *et al.* reference". On the other hand, the Greenstein *et al.* reference makes use of OFDM and is concerned with costs of supplying multiple receiver antennae (see column 1, lines 24 to 38 of the Greenstein *et al.* reference). None of these problems have to do with the present invention as claimed in claim 1, and Applicant submits that one of skill in the art having knowledge of the Keskitalo *et al.* reference would not look to the OFDM system of the Greenstein *et al.* reference to modify the system in the Keskitalo *et al.* reference from a CDMA system to an OFDM system, especially when moving away from the CDMA system would take away the perceived advantages of the CDMA system, as emphasized in the Keskitalo *et al.* reference.

Thus, none of the requirements for a *prima facie* case obviousness are satisfied, and the 35 U.S.C. §103(a) rejection of the claims based thereon cannot legally stand.

Claim 32

Claim 32 is directed to an OFDM Base Transceiver (BTS) station arranged to communicate with a plurality of mobile terminals within a coverage area, and should be allowed for the same reasons as discussed above with reference to claim 1.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 32.

Claims 2 and 33

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Claims 2 and 33 depend on claims 1 and 32, respectively, and should be allowed for the same reasons as discussed above with reference to claims 1 and 32. Furthermore, claims 2 and 33 recite in pertinent part:

“wherein the service information comprises pilot information and signalling information”.

The Examiner has referred to column 9, lines 23 to 32 of the Keskitalo *et al.* reference as disclosure for this claim feature. With respect, although this passage makes reference to pilot signals there is no reference being made to the pilot signals containing signalling information.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 2 and 33.

Claims 3 to 5, 9, 10, 13, 14, 23, 25, 27, and 29

Each one of claims 3 to 5, 9, 10, 13, 14, 23, 25, 27, and 29 depends directly or indirectly on claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 3 to 5, 9, 10, 13, 14, 23, 25, 27, and 29.

Claim 6

Claim 6 contains all of the features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 6 recites the additional claim feature:

“wherein the transmission apparatus comprises a plurality of first transmission beam output paths, each of the first transmission beam output paths comprising a transmitter coupled to the processing apparatus and a directional antenna coupled to its respective transmitter; and

wherein each of the first transmission beam output paths receives the processed service information from the processing apparatus and operates to generate a portion of the first

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transmission beam, each of the portions of the first transmission beam being focussed on a portion of the coverage area”.

The Examiner has referred to column 3, lines 33 to 48 of the Greenstein *et al.* reference as disclosure for this claim feature. With respect, in this passage what is disclosed with reference to Figure 2A of the Greenstein *et al.* reference are two different transmit processing circuits 202 and 203. These circuits are connected to respective antennae 15 and 16. However, there is no disclosure of “each of the first transmission beam output paths receives the processed service information from the processing apparatus and operates to generate a portion of the first transmission beam, each of the portions of the first transmission beam being focused on a portion of the coverage area” (emphasis added on the underlined portion).

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 6.

Claim 7

Claim 7 contains all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 7 recites the additional claim feature:

“wherein the transmission apparatus further comprises a plurality of second transmission beam output paths, each of the second transmission beam output paths comprising a phase adjuster coupled to the processing apparatus and further coupled in series with a transmitter and an antenna; and

wherein the second transmission beam output paths each receive the processed data traffic information from the processing apparatus and operate together to generate the directional second transmission beam by selectively adjusting their respective phase adjusters”.

The Examiner has referred to column 10, lines 39 to 50 of the Keskitalo *et al.* reference as disclosure for this claim feature. With respect, this passage makes reference to Figure 6 of the Keskitalo *et al.* reference in which there are Channel Elements (CE) 504, 506, 508 connected in

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parallel with antenna groups 500, 502. With respect, the CEs 504, 506, 508 are not connected in series but rather are connected in parallel. As such, there is no disclosure of "each of the second transmission beam output paths comprising a phase adjuster coupled to the processing apparatus and further coupled in series with a transmitter and an antenna". Furthermore, Applicant cannot find any disclosure of "the second transmission beam output paths...operate together to generate the directional second transmission beam by selectively adjusting the respective phase adjusters".

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 7.

Claim 8

Claim 8 depends on claim 7 and should be allowed for the same reasons as discussed above with reference to claim 7. Furthermore, claim 8 recites the additional claim feature:

"wherein the first transmission beam output path and one of the second transmission beam output paths share a common transmitter and antenna; and

wherein the shared transmitter receives the processed service information from the processing apparatus and receives phase adjusted data traffic information from the output of the phase adjuster within the particular second transmission beam output path".

The Examiner has referred to column 10, lines 39 to 50 of the Keskitalo *et al.* disclosure for the above claim feature. With respect, the above claim feature makes reference to the first transmission beam output path, and the Examiner has previously referred to the Greenstein *et al.* reference as disclosure for the first transmission beam output path because it was not disclosed in the Keskitalo *et al.* reference. As such, the above claim feature cannot be disclosed by Keskitalo alone without reference to the Greenstein *et al.* reference, and the Examiner has not shown how the Keskitalo *et al.* and Greenstein *et al.* references can be combined to produce the claim feature of claim 8. Furthermore, the passage referred to by the Examiner simply discloses transmission of user data bits and there is no reference to processed service information. As such, there can be

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no disclosure of “the shared transmitter receives the processed service information from the processing apparatus and receives phase adjusted data traffic information from the output of the phase adjuster within the particular second transmission beam output path”.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 8.

Claim 11

Claim 11 contains all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 11 recites:

“wherein the transmission apparatus further comprises a second transmission beam transmitter coupled to the processing apparatus, a switch coupled to the second transmission beam transmitter and a plurality of second transmission beam directional antennas coupled to the switch; and

wherein the switch receives the processed data traffic information from the second transmission beam transmitter and selectively forwards the processed data traffic information to a set of the second transmission beam directional antennas to generate the directional second transmission beam”.

The Examiner has referred once again to column 18, lines 39 to 55 of the Keskitalo *et al.* reference as disclosure for this claim feature. With respect, this passage refers to elements found in Figure 10 of a switching matrix 744 found in Figure 8 of the Keskitalo *et al.* reference. With respect, in Figure 8 the switching matrix 744 is coupled to a TX (Transmit) matrix 770, and data is received by the switching matrix 744 and sent to the TX matrix 770. This is different from what is contemplated in claim 11 wherein “the switch receives the process data traffic information from the second transmission beam transmitted and selectively forwards the processed data traffic information to a set of the second transmission beam directional antennas to generate the directional second transmission beam”. Instead, in Figure 8 of the Keskitalo *et al.* reference it is the TX matrix 770 that receives user data from the switching matrix 744 and not the switching matrix 704 that receives user data from the TX matrix 770.

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The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 11.

Claim 12

Claim 12 depends on claim 11 and should be allowed for the same reasons as discussed above with reference to claim 11.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 12.

Claim 15

Claim 15 contains all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 15 should be allowed for the same reasons as discussed above with reference to claim 7.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 15.

Claim 16

Claim 16 depends on claim 15 and should be allowed for the same reasons as discussed above with reference to claim 15. In particular, the additional claim feature recited in claim 16 is the same claim feature as in claim 7, namely:

“wherein the transmission apparatus further comprises a plurality of second transmission beam output paths, each of the second transmission beam output paths comprising a phase adjuster coupled to the processing apparatus and further coupled in series with a transmitter and an antenna”.

However, the Examiner is now citing a different passage than that recited for the claim feature of claim 7. In particular, the Examiner is now referring to column 15, lines 23 to 25 of the Keskitalo *et al.* reference as disclosure for the above claim feature. Applicant submits that this passage has nothing to do with the above claim feature.

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The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 16.

Claim 17

Claim 17 depends on claim 16 and should be allowed for the same reasons as discussed above with reference to claim 16. Furthermore, claim 17 should also be allowed for the same reasons as discussed above with reference to claim 8.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 17.

Claim 18

Claim 18 contains all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 18 recites the additional claim feature:

“wherein the transmission apparatus comprises a plurality of output paths, each output path comprising a first transmission beam phase adjuster coupled to the processing apparatus, a second transmission beam phase adjuster coupled to the processing apparatus, a transmitter coupled to both its respective first and second phase adjusters and an antenna coupled to its respective transmitter;

wherein the output paths each receive the processed service information from the processing apparatus at their respective first transmission beam phase adjusters and the output paths operate together to generate the directional first transmission beam by selectively adjusting their respective first transmission beam phase adjusters; and

wherein the output paths each receive the processed data traffic information from the processing apparatus at their respective second transmission beam phase adjusters and the output paths operate together to generate the directional second transmission beam by selectively adjusting their respective second transmission beam phase adjusters”.

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The Examiner has referred to column 9, lines 23 to 32 and 44 to 55 of the Keskitalo *et al.* reference as disclosure for this claim feature. With respect, these passages have nothing to do with the above claim feature. In particular, there is no disclosure of any first transmission beam phase adjuster or any second transmission beam phase adjuster as recited in claim 18. As such, there is no disclosure of the structure defined in this claim feature nor any of the functionality defined.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 18.

Claim 19

Claim 19 contains all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 19 recites:

“wherein the transmission apparatus comprises a first transmission beam switch coupled to the processing apparatus and a plurality of first transmission beam output paths coupled to the first transmission beam switch, each of the first transmission beam output paths comprising a transmitter coupled to the first transmission beam switch and a directional antenna coupled to its corresponding transmitter; and

wherein the first transmission beam switch receives the processed service information from the processing apparatus and selectively forwards the processed service information to a set of the first transmission beam output paths to generate the directional first transmission beam”.

The Examiner has once again referred to column 9, lines 23 to 32 and 44 to 55 of the Keskitalo *et al.* reference as disclosure for this claim feature. These passages refer to how “a pilot signal that uses antenna beams that change in time in the transmission and reception of data signals” is transmitted. The passages also disclose how a first pilot signal is transmitted in a predetermined transmission direction 560 (Figure 5) that remains constant in time and that is an omni directional pattern. These passages also further disclose how a base stations further transmits second pilot signals to mobile stations with radiation patterns 556, 558 that correspond to traffic channels. However, with respect, there is no reference to any “first transmission beam

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switch coupled to the processing apparatus” nor any reference to “a plurality of first transmission beam output paths coupled to the first transmission beam switch, each of the first transmission beam output paths comprising a transmitter coupled to the first transmission beam switch and a directional antenna coupled to its corresponding transmitter”.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 19.

Claims 20 to 22

Each one of claims 20 to 22 depends directly or indirectly on claim 19 and should be allowed for the same reasons as discussed above with reference to claim 19.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 20 to 22.

Claim 26

Claim 26 contains all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 26 recites the additional claim feature:

“wherein the at least one data traffic and service information processor comprises a data traffic information processor, a signalling information processor and a pilot information processor”.

The Examiner has referred to column 10, lines 39 to 50 of the Keskitalo *et al.* reference as disclosure for this claim feature. With respect, there is no disclosure in this passage of any one of “a data traffic information processor, a signalling information processor and a pilot information processor”.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 26.

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Claim 28

Claim 28 contains all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. Furthermore, claim 28 recites the additional claim feature:

“wherein the transmission apparatus operates to transmit the processed service information with at least one signalling information transmission beam and at least one pilot information transmission beam”.

The Examiner has once again referred to column 9, line 64 to column 10, line 7 of the Keskitalo *et al.* reference as disclosure for this claim feature. With respect, there is no reference being made to “at least one signalling information transmission beam” in this passage. Instead, what is being referred to in this passage is a pilot signal. With reference to page 1, lines 12 to 28 of the present application, a distinction is made between signalling and information pilot information.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 28.

Claims 34, 36, 37, and 41

Each one of claims 34, 36, 37, and 41 depends on claim 32 and should be allowed for the same reasons as discussed above with reference to claim 32.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 34, 36, 37, and 41.

Claim 35

Claim 35 depends on claim 32 and should be allowed for the same reasons as discussed above with reference to claim 32. Furthermore, claim 35 recites the additional claim feature:

“wherein the transmission apparatus comprises a plurality of output paths, each of the output paths comprising a phase adjuster coupled to the processing apparatus and further coupled

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in series with a transmitter and an antenna”.

The Examiner has referred to column 3, lines 33 to 48 of the Greenstein *et al.* reference as disclosure for this claim feature. This passage refers to Figure 2A of the Greenstein *et al.* reference, and Applicant cannot find any disclosure in Figure 2A of “a plurality of output paths, each of the output paths comprising a phase adjuster coupled to the processing apparatus and further coupled in series with a transmitter and an antenna”.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 35.

Claim 38

Claim 38 depends on claim 32 and should be allowed for the same reasons as discussed above with reference to claim 32. Furthermore, claim 38 should be allowed for the same reasons as discussed above with reference to claim 11.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 38.

Claim 39

Claim 39 depends on claim 38 and should be allowed for the same reasons as discussed above with reference to claim 38.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 39.

Claim 42

Claim 42 contains all of the claim features of base claim 32 and should be allowed for the same reasons as discussed above with reference to claim 32. Furthermore, claim 42 should be allowed for the same reasons as discussed above with reference to claim 26.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of

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claim 42.

Claim 46

Claim 46 should be allowed for the same reasons as discussed above with reference to claim 32.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 46.

Rejection of Claims 24 and 40

On page 18 of the Detailed Action, the Examiner has rejected claims 24 and 40 under 35 U.S.C. 103(a) as being unpatentable over the Keskitalo *et al.* reference in view of the Greenstein *et al.* reference, and further in view of United States Patent No. 6,512,797 (Tellado *et al.*). Given below is a discussion on how claims 24 and 40 are patentable over the Keskitalo *et al.*, Greenstein *et al.*, and Tellado *et al.* references.

Claim 24

Claim 24 depends on claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. In particular, the Examiner's rejection of claim 24 is based on the false premise that the Keskitalo *et al.* and Greenstein *et al.* references disclose all of the claim features of base claim 1, and Applicant submits that the Tellato *et al.* reference also fails to disclose the features of base claim 1 that the Keskitalo *et al.* and Greenstein *et al.* references fail to disclose.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claim 24.

Claim 40

Claim 40 depends on claim 32 and should be allowed for the same reasons as discussed above with reference to claim 32. In particular, the Examiner's rejection of claim 40 is based on the false premise that the Keskitalo *et al.* and Greenstein *et al.* references disclose all of the claim

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features of claim 32, and Applicant submits that the Tellato *et al.* reference also fails to disclose the features of base claim 32 that the Keskitalo *et al.* and Greenstein *et al.* references fail to disclose.

Rejection of claims 30 and 31

On page 19 of the Detailed Action, the Examiner has rejected claims 30 and 31 under 35 U.S.C. 103(a) as being unpatentable over the Keskitalo *et al.* reference in view of the Greenstein *et al.* reference, and further in view of United States Patent No. 6,678,527 (Rasanen).

Claims 30 and 31 contain all of the claim features of base claim 1 and should be allowed for the same reasons as discussed above with reference to claim 1. In particular, the Examiner's rejection of claims 30 and 31 is based on the false premise that the Keskitalo *et al.* and Greenstein *et al.* references disclose all of the claim features of base claim 1, and Applicant submits that the Rasanen reference also fails to disclose the features of base claim 1 that the Keskitalo *et al.* and Greenstein *et al.* references fail to disclose.

The Examiner is respectfully requested to withdraw the 35 U.S.C. 103(a) rejection of claims 30 and 31.

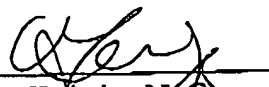
The Abstract has been amended to replace the expressions "requires" and "must receive" with "is provided with" and "are provided with", respectively.

The Examiner is respectfully requested to pass this application to allowance but, if there are any outstanding issues, the Examiner is respectfully requested to telephone the undersigned.

Respectfully submitted,

KOON H. TEO, ET AL

By


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Date: October 13, 2004
CNG:MPP:acb